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THE SCIENCE NEWS-LETTER

A Weekly Summary of Current Science

EDITED BY WATSON DAVIS

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TEMPLE HIDDEN IN PYRAMID IS FOUND IN ANCIENT MAYA RUINS

A temple to the Plumed Rattlesnake God of the ancient Maya, buried beneath the pyramids raised to honor the same deity by a more recent culture of the same race, is the find reported to the Carnegie Institution of Washington by its investigator in the Yucatan jungles, Dr. Sylvanus G. Morley.

During his excavations in the ruined city of Chichen Itza this summer, Dr. Morley came upon fragments of stone work buried under the earthen embankments of the great pyramid which he had already largely explored. These gave the hint that the pyramid, the bulk of which consists of earth filling, unlike the pyramids of Egypt which were built of solid stone, might conceal a building even more ancient than itself. This proved to be the case.

The exploring party first discovered the columns of the old temple, which were in the form of the conventionalized plumed serpent which forms the motif of much Maya architecture, their capitals and bases being formed by the heads and tails of the great stone snakes. They were brilliantly painted in red, yellow, green and black, and the colors, due to the protection the earth had given them through the centuries, were still fresh and vivid. Further excavations brought to light a side wall of the temple, likewise bright with ancient decoration. Due to the near approach of the rainy season a complete unearthing of the building was not thought of, but instead the parts that had already been exposed were again banked in with earth to protect them against the weather until the rains shall have passed.

The principal efforts of the Carnegie Institution's workers during the season have been directed to the further uncovering and reassembling of the tremendous figured frieze in the many-columned Temple of the Warriors. Parts of these mural paintings depicted the ordinary daily life of the citizens of the Maya state just as the old Egyptian wall pictures told of the occupations of the people along the Nile. Another painting showed a rather horrifying ceremony of human sacrifice, resembling the rites which the Spaniards found in existence among the Aztecs of Mexico at the time of the conquest.

YOUNGEST HUMAN DISCOVERED IN MINUTE EMBRYO

The Pithecanthropus erectus of human embryos has been discovered and made known to science. It is a scarcely visible mass of cells but it is the youngest human being on record.

Since the evolution of the human race is recapitulated in the development of the baby before birth, this rare speciman, known as the Miller ovum, is representative of the very dawn of humanity. Embryologists are as excited over the discovery as the anthropologists are when the skeletons of ancient man come to light.

Dr. George L. Streeter, head of the Department of Embryology of the Carnegie Institution of Washington, here, will soon publish an exhaustive study and detailed description of the Miller ovum.

The development of the embryo from the time of fertilization to birth has been carefully studied in many of the lower animals but the opportunities to study the human embryo in its early stages have been rare. According to Dr. Streeter there is no other normal human embryo known to science quite so young as the 'Miller' ovum, which is estimated to be only eleven days old. This specimen, then, affords the very first view of man in the making.

It was discovered in 1909 by Dr. J. W. Miller, at that time an assistant in the Woman's Clinic at the University of Heidelberg. The womb of a patient suffering from dysmenorrhea was scraped. As customary, the material obtained was placed at once in a chemical solution which "fixed" or preserved it for later examination. In reporting the case, Dr. Miller noted the discovery of the embryo which he carefully preserved on glass.

Not being a specialist in embryology himself, Dr. Miller recently sent this embryo to Dr. Streeter for study and publication in such form as to make this rare object available to embryologists everywhere.

The Miller ovum is just large enough to be visible to thenaked eye, a mere speck, but when seen under the microscope it is apparent that this individual has been quite busy during the eleven days of its life. Instead of a single cell there is an elaborate group of cells. A central cell mass is clearly discernable attached to one side of theinner surface of a larger ring or "balloon" which it has thrown out, and from which streamers or arms penetrate the mother substance for the purpose of preparing the necessary surroundings for the normal development of the central cell mass or embryo proper.

Dr. Streeter andhis staff illustrate the report with beautiful microphotographic color plates which reproduce with accuracy not only the structural details but also the delicate shades of coloring as seen under themicroscope.

The disease of rabies is said to be increasing in this country.

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NEBULA CLUSTER IS SUPER UNIVERSE

What is described as a cloud of galaxies, containing more than a hundred spiral nebulae, each similar in nature to the group of stars of which the sun and all the visible stars are part, is the object under study at the Harvard College Observatory by Dr. Harlow Shapley, director of the observatory, and Miss Adelaide Ames, of the observatory staff.

So distant is this cloud of nebulae that the light from the center of it takes about ten million years to reach the earth, though travelling fast enough to go from New York to California in a seventy-fifth of a second. Its diameter is approximately one-fifth of its distance from the sun, says Dr. Shapley, so that a beam of light would take about two million years to cross it. Thus it is the largest thing known to science, and the most distant that has been measured.

The cluster is located in the neighboring constellations of Virgo and Coma Berenices, or Berenice's Hair, both of which are now visible in the western evening sky, and includes at least 103 well defined spiral nebulae. One of these is known as Messier 61, and in it two German astronomers recently discovered a nova, or new star, which flashed out from previous obscurity. The brightness of this nova was so much fainter than such novae which occur in the sun's neighborhood, that it confirmed the distance of ten million light years estimated by Dr. Shapley to be the distance of the cluster.

That these nebulae actually belong to one system is indicated by their concentration as compared with regions of the sky nearby where the nebulae are much scarcer. Of the 103 in the group, says Dr. Shapley, two-thirds are within 5 degrees, or ten times the diameter of the moon, of the center, while thirty-seven are within three degrees of the center.

That the spiral nebulae, of which many thousands are known in various parts of the sky, are stellar systems or galaxies outside the system of which the sun is a member, was shown last year by Dr. Edwin P. Hubble, of the Mt. Wilson Observatory, who measured the distances of two of the most conspicuous of them. These two were both shown to be about a million light years away, and while they are considerably smaller than our galaxy, including the Milky Way, they are very similar to it. Dr. W. W. Campbell, president of the University of California and director of the Lick Observatory, one of America's most eminent astronomers, in an address before the American Astronomical Society following the announcement of Dr. Hubble's work, said, "We do not know, I must confess, that our stellar system is now a spiral nebula, or that it is the developed product of a spiral of ages past, but it does seem to have most of the known attributes of a spiral."

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Moist soap rubbed on a mosquito bite will allay the irritation.

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PREHISTORIC INDIAN TRADE COVERED LONG DISTANCES

The Indians who once roamed the vast plains and forests of western America maintained complex trade relations with distant tribes, according to evidence just brought back from thenorthwest by Herbert W. Krieger, curator of ethnology of the U. S. National Museum.

In his expedition he examined graves of prehistoric Indians at numerous locations along the Columbis River, and he has found from 80 to 100 different types of articles used, from pipes, pottery, and headdresses to stone clubs and arrow points.

To the ethnologist, these long buried objects indicate the work of various groups of Indians, and show that articles were exchanged throughout the west, from the Pueblos of the south, to the California coast tribes, the Haida of Alaska, and the Eskimo and Chuckee of the Arctic, and even tribes as far east as Minnesota.

"The Columbia River was the center of much trading, because it was the direct route of entrance from the north into the American continent," Mr. Krieger told a representative of Science Service. "Horses were not yet known in thatpart of the country, and the Indians depended on rivers as their chief routes of travel. They lived near the water, and used the back country only forhunting game in the mountains and for portage in getting from one water-course to another. They traveled along the rivers to seek food and to barter articles that they had for different kinds of things made by other tribes."

The objects found by Mr. Krieger are all from a period before the white man's coming, he says, because no glass beads or other indications of the white man's presence are found among the relics. The articles unearthed were burial offerings which were placed with the remains of their former owners.

So many of the weapons and jars are broken that Mr. Krieger believes that this must have been done deliberately by the Indians who placed them in the graves, so that no one else would ever use them.

SCRAPPED FORDS AND TIN CANS SALVAGEABLE BY ELECTRICITY

Discarded tin cans and automobile bodies, as well as other forms of iron which now go to waste on dump heaps, may be an important source of a very pure form of iron in the future, according to the Engineering Foundation, of New York City.

Twenty million tons of iron are said to go to waste annually because of rust, but this can be greatly reduced by the use of this iron, which scores even higher than a popular brand of soap, for the iron obtained by these electric methods is 99.96 per cent. pure.

It is called electrolytic iron, and a plant has just been established at Niagara Falls to produce it, says the Foundation, as a result of cooperation between French and American inventors. While the first electrolytic iron was produced half a century ago in America, the original product was so rough and brittle that nothing much could

be done with it. Scientists in many countries had been working on it, the greatest success being attained in France and the United States. Then it was found that the firms in each of these countries had knowledge and patents which were valuable to the other, so they combined forces.

The method consists in using bars of cast iron as anodes of huge wet batteries, the liquid being a solution of iron chloride. The cathode, the other terminal of the battery, consists of a bar of steel, and when the current ispassed through, the iron dissolves from the cast iron bar into the liquid, and at the same time is deposited from the solution onto the steel bar.

The iron deposited on the steel bar forms a cylinder, up to a quarter of an inch thick. The metal, on theinside, next to the steel, which is deposited first, is full of hydrogen, which makes the iron brittle, but this gas is removed by passing the cylinder through an oil-heated furnace. A stripping machine is used which enlarges the diameter of the iron tube, so that it may be slipped off the steel cathode, which is used over and over again. The tubes may be used as they come from the machine for some purposes, or they may be flattened, or slit andmade into plates from which other iron objects may be made.

Since only iron is deposited by this process, it is suggested that waste iron from dump heaps might be reclaimed by dissolving in the iron chloride solution and recovering it electrolytically.

PIKE, "PRESIDENT'S FISH", HAS HAD NOTABLE HISTORY

The pike, the big, hard-fighting game fish that has received much publicity lately through falling victim to the Waltonian prowess of President Coolidge, is a creature of high historic traditions, according to Lewis Radcliffe, U. S. Deputy Commissioner of Fisheries. His fame goes back to Roman times at least, for Mr. Radcliffe has found a verse about him in the works of the Latin writer Ansonius, which translated reads:

"The wary pike, 'midst wrack and rushes hid,
The scourge and terror of the scaly brood
Unknown at friendship's hospitable board,
Smokes midst the smoking tavern's coarsest food."

According to Mr. Radcliffe the high esteem in which it was held is revealed in that during the reign of Edward I, the King fixed the price at double that of the salmon and over ten times that of the cod. As late as the Reformation a large pike equalled in value a lamb and a small one more than a fat capon. The pike was introduced into England about 1532. An old couplet ran -

"Turkies, Carps, Hops, Pickerel, and Beer
Came into England all in one year."

"Izaak Walton devotes an entire chapter to observations and directions for fishing for the Luce, or Pike, recounting the antipathy between the pike and some frogs," says Mr. Radcliffe. "Of a method of cooking the pike he states: "This dish of meat

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is too good for any but anglers, or very honest men; and I trust you will prove both, and therefore, I have trusted you with this secret.'

"A very old work in the heraldry of fish recounts that 'the Pike of the fisherman, the tyrant of the river, is the Luce of heraldry. There is no earlier example of fish borne in English heraldry than is afforded by Pike, in the arms of the family of Lucy, which was of Norman extraction.' This coat of arms bore three white pike on a red background.

"The true pike is a voracious fish, destroying everything within its reach and consuming other fish, water birds, and mammals. At times it attains a length of four feet and a weight of forty pounds or more. It is taken by trolling, skittering, with the fly, or by using live minnows for bait. In skittering a small frog or frog-leg, a minnow, or a piece of perch belly may be used.

"There are several other species belonging to the Pike family including the muskellunge, which reaches a weight of 100 pounds or more, and several smaller species commonly called pickerel. In Canadian waters, the pike perches, a wholly unrelated species, are termed pickerel. There are two commercially important species, the blue pike (perch) and the yellow, numbered among the most important food fishes of the Great Lakes."

WOULD RECOVER OIL BY MINING METHODS

Sinking mine shafts into oil-bearing rocks instead of merely drilling wells, is the method proposed for the more complete recovery of the precious liquid mineral by Leo Ranney, a New York engineer. A number of important oil companies have become interested in his process, and field tests on a large scale are a probable development for the near future.

The present method of sinking wells, Mr. Ranney explains, simply makes holes into the oil-bearing sandstone, and at best only about one-fifth of the oil flows or is pumped to the surface. The rest is trapped in the cavities of the porous rock. By going down to the oil-bearing stratum it is possible to tap it in a large number of places, and thus greatly cut down the distance necessary for the oil to flow through the sandstone before it finds an outlet.

Mr. Ranney's oil-mining system contemplates cutting tunnels not in the oil rock itself, but in thehard stone either above or below it, usually below. From these tunnels small holes would be bored into the oil stratum at close intervals. Through these holes pipe nipples would be inserted, and then connected to pipe lines leading to the shaft, where the oil would be allowed to collect in a tank or pool, to be pumped to the surface. The flow of the oil into the collecting pipe system could be hastened by the use of compressed air or other means.

A prominent government official has suggested that naval oil reserves could be converted virtually into underground storage tanks by rigging them with such a collection system and then leaving the field unexploited until necessity should arise to bring out the oil quickly foruse in an emergency.

SOLVE MYSTERY OF GIANT CELLS OF BLOOD

The mystery of the "giant cells" in the blood seems now at last to have been solved.

Dr. W. H. Lewis, of the Embryological Laboratory of the Carnegie Institution has found by actual observation of cultures outside the body that the so-called "giant-cells", present in pathological cases, - especially in tubercular conditions, are formed by the fusion of a number of white blood cells.

The "giant" is a large cell with several, some times many, nuclei. There have been two theories as to their formation; one that they were made by splitting the nucleus; the other that they come by combination or fusion of separate cells. Instances of nuclear division have been noted and Dr. Lewis thinks that it is probable that many "giant cells" are formed in that way, but it is now certain that they are formed by fusion also.

The body of an adult person, Dr. Lewis estimates, contains from 250 to 500 trillions of living cells, every one different from every other one, just as personalities differ, but capable of being grouped in certain classifications according to their functions and structure. There are brain cells, nerve cells, muscle cells, bone cells, blood cells and many other specialized groups.

The majority of these cells have settled down in definite locations, formed definite contacts with their neighbors and perform definite, specialized functions. The rest are nomads or wanderers. They travel about the main highways of the body in the blood currents, but, not content with this, they penetrate the walls of the blood vessels and wander at will. According to Dr. Lewis, there are billions of these nomads wandering freely about the body all the time.

In return for this freedom, the wanderers render a valuable service to the stationary cells. They act as scavengers. They eat up the waste from the other cells, and in an emergency they gather in great numbers at any point of injury to clear away the wreckage. In case of a severe bruise, turning the flesh "black and blue", it may take the wreckers days or even weeks but they stay on the job until the debris is cleared away and theordinary tissue cells repair the damage.

Numerous and different as are these many varieties of cells, they have all arisen from the primitive cell of embryonic tissue, through the process of division and different lines of specialization, Dr. Lewis states.

Modified white blood cells were taken by Dr. Lewis from rat tumors and cultivated in sealed glass containers with a nutrient material for the cells to live on. In this way the behavior of individual cells was watched for weeks. They constantly came in contact in various positions. Certain cells were observed to fuse with "giant cells", the cell protoplasm being absorbed into the "giant" and their nuclei being drawn into the group or circle of nuclei of the "giant". Other cells, for some unknown reason, possibly because of a temporary chemical or functional difference, declined to fuse.

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MILK-FED BLUEBERRIES THRIVE IN U. S. GARDENS

Milk-fed blueberries will probably figure along with milk-fed pullets on restaurant bills of fare before long. In the greenhouses of the U. S. Department of Agriculture Dr. F. V. Coville, expert on blueberries and other acid-soil plants, has been experimenting with buttermilk and sour milk as fertilizers, and he finds that they work very well.

Some years ago Dr. Coville showed the world how to put blueberry culture on a regular, profitable farming basis, by seeing that they got acid soils in which to grow, instead of the neutral or slightly alkaline soils demanded by most crops. The question of a nitrogen-bearing fertilizer, which all plants must have, still remained, for acid soils are notoriously poor in nitrogen and somehow seem to resist the application of the ordinary kinds of nitrate fertilizers.

Milk, Dr. Coville reflected, is rich in nitrogen compounds, and buttermilk, sour milk, whey and similar acidulous dairy products are rather a drug on the market. So he tried those various nitrogen-bearing milk products on a lot of young blueberry bushes, as well as on some azaleas and a few other similar plants that naturally thrive in sour soils.

The results of his experiment, reported in a recent issue of Science, are a striking confirmation of his initial theory. The bushes, which are as yet too small to bear a crop, pushed along their growth in a most astonishing fashion, outstripping companion plants left without milk by a good third in length of stem, and producing larger, greener, healthier-looking leaves.

Apparently, however, there can be too much of a good thing. One lot of bushes was given a heavy overdose of whey, and showed definite signs of ill health. This Dr. Coville attributes to too much acid; for bushes on a smaller ration of whey throve very well.

Dr. Coville concludes that if further experiments bear out the first results, there is an excellent prospect of using dairy materials nowlargely wasted or sold at low figures to encourage the young and pushing industry of blueberry culture and to help along the growth of rhododendrons, azaleas and similar ornamental plants.

RATS SLAUGHTERED WHOLESALE BY COLLOIDAL ARSENIC POISON

The Mellon Institute of Pittsburgh boasts of the presence on its campus of a veritable Pied Piper of Pittsburgh; for Dr. Oscar F. Hedenburg, holder ofone of its industrial fellowships, has worked out a new method of using an old poison that promises to wipe out rats and mice in the wholesale fashion related by Browning in his famous poem.

In his search for the most efficient means for cleaning out rodent pests Dr. Hedenburg tried numerous unusual poisonous compounds, but finally came back to the old favorite white arsenic, or arsenious oxide, known since the days of the Borgias. He found, however, that the ordinary commercial product is too uncertain in its action, and that rats could sometimes swallow what should be killing doses and only

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get fat on them. The trouble seemed to be that the ordinary white arsenic was not ground find enough, and that it would not dissolve satisfactorily in water. But when he ground it in water containing an organic colloid substance, like gum arabic or glue, the arsenic was reduced to an almost impalpable fineness - became, in fact, a colloid itself.

In this condition it was extremely effective and almost incredibly rapid. A bait containing one two-hundredth of an ounce killed a rat in thirty minutes, whereas the same dose of ordinary arsenic required twenty-four hours for fatal effect.

A large-scale test was made on a dump where scores of big rats fattened. Two pounds of poisoned bait was distributed, and many rats were seen carrying it off. Ten days later only a couple of rodents were left out of the whole population.

Dr. Hedenburg suggests that when his discovery is put into regular use and marketed, it may be put up into tubes as a paste, to make for economy in use, and that for safety's sake the paste should be colored blue.

WATER GAS MAY BE NEW SOURCE OF GASOLINE

Water gas, which forms a part of most city gas, and is obtained by passing steam over hot coke, may become an important source of gasoline in the future. This is indicated by experiments of Prof. Franz Fischer and his assistants working at the Kaiser Wilhelm Research Institute for Coal Products, at Muelheim on the Ruhr.

The process makes use of a catalyst, a substance which accelerates a chemical reaction, but is not itself changed in the process, and Prof. Fischer says that by choosing the proper catalyst, temperature and pressure, not only gasoline, but wood alcohol, vaseline, and other related substances can be obtained.

To make gasoline, says Prof. Fischer, the water gas, from which all traces of sulphur must have been removed, is passed over a catalyst consisting of a finely divided mixture of cobalt with oxides of such metals as chromium or zinc, at a temperature of 500 degrees Fahrenheit.

It is said that gasoline thus prepared compares favorably with the best natural product, and requires no further refining, because the sulphur has already been eliminated from the raw material.

The Arabian horse has fewer vertebrae in its back and tail than other horses.

Searchlights that can be attached to lifeboats are now on the market.

TABLOID BOOK REVIEW

THE QUARTERLY REVIEW OF BIOLOGY. Edited by Raymond Pearl. Baltimore: Williams and Wilkins Co. $5.00 a year.

Dr. Pearl's nice new journal occupies a position among scientific periodicals comparable to the American Mercury in the realm of regular literature. He has quite apparently determined that his publication shall follow other lines from those of the usual hidebound journal of science, as obviously as H.L.M. has "Down with bunk" inscribed on the coat of arms of the intelligentsia's guide.

The ground covered spreads beyond the boundaries of the lay conception of the biological sciences into psychology, paleontology, anthropology and geographical distribution, giving much needed correlation to these allied branches. There is an advisory board which consists of men who are the last court of appeal in each of these varied fields, as well as in the different divisions of biology proper. It suffices to say that the material which gets by such authoritative check up is scientifically sound. The character of the papers thus far published are thorough and comprehensive general surveys of a definite range. They do not partake of the character of sensational research.

Readable book reviews, some of them positively entertaining, and a literally priceless Fundamentalist Portrait Gallery are appreciated features out of the ordinary. The Review will interest the "general reader" who rarely ventures to open a professorial periodical.

EVOLUTION AND OPTIMISM. By Ludwig Stein. New York: Thomas Seltzer, 1926. $3.00.

"Sagt Ja!" was the battle-cry of the older generation of optimistic philosophers, whose voices in English rose chiefly around the turbid but vigorous Carlyle. Then came the first popularity of evolution, which to all but the stoutest-hearted seemed to mean that the world was all mechanistic sound and fury, signifying nothing. But out of the new chaos voices of affirmation still sounded, and these grew more numerous and clearer as mechanistic doctrine, or at least its cruder early form, is forced back again. Dr. Stein has gathered together a number of these newer "Yes-saying" men and given a synthetic interpretation of their doctrines from an evolutionary standpoint, together with certain teachings of his own.

THE REAL BOY AND THE NEW SCHOOL; by A. E. Hamilton. New York, Boni and Liveright, 1925. 386 pp., $2.00.

Mr. Hamilton has evidently had a wide acquaintance with boys in a long career as a teacher, and in this stimulating book he tells of some of his experiences in a conversational style. These have been gained not only with boys in the class room, but also in summer camps where he has been able to come into contact with another phase of boy life.